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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MARSH FISCHMANN & BREYFOGLE, LLP
3151 S. VAUGHN WAY
SUITE 411
AURORA, CO 80014

EXAMINER

THOMPSON, TIMOTHY J

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 06/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,516

Applicant(s)

HANDSCHY ET AL.

Examiner

Timothy J Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-14 and 16-35 is/are rejected.
- 7) ☒ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Objections

Claim 23 is objected to because of the following informalities: Claim 23 claims "a support surface", however this limitation is never defined in the specification.

Appropriate correction is required. Additionally claims 24-35 are also objected to since they depend from claim 23.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10, 12, 13, 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Florence (U.S. Patent No. 5,640,214) in view Palmer (U.S. Patent No. 5,847,868) .

Regarding claim 10, Florence discloses; a source of light(fig 12, 42); a microdisplay(fig 12, 15) ; a reflector in position to reflect the light from the source of light to eventually illuminate the microdisplay(fig 12, 46a, 46b, 44b, 44a, 58). Florence does not specifically disclose a support surface; the light and the microdisplay are located proximate to the support surface and the reflector is located above the support surface.

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Regarding the support surface, Palmer discloses a support surface(fig 2, 80) used for fixing optical components, which work together, in there necessary positions with the optical components fixed to the top of the support surface(fig 2 and col 8, lines 31-53). It would have been obvious to one skilled in the art at the time of the invention to use a support structure for affixing the optical components to the top of the structure as shown by Palmer, in the optical device of Florence, since as shown by Palmer, support structure with optical components attached to the top of the structure are commonly used in optical devices so as to properly align the optical components. Additionally, by attaching the light, microdisplay and reflectors to the top of the support surface, the light and the microdisplay are obviously located proximate to the support surface and the reflector is located above the support surface.

Regarding claim 12, Florence discloses the reflector is curved(fig 12, 46a, 46b).

Regarding claim 13, Florence discloses the reflector is a beam splitter(fig 12, 58).

Regarding claim 16, Florence discloses wherein the microdisplay is a reflective microdisplay(col 3, lines 9-10).

Regarding claim 17, Florence discloses optical elements positioned in a light path above the microdisplay(fig 12, 5), wherein the microdisplay is a reflective microdisplay(col 3, lines 9-10), wherein the optical elements are receptive of light reflected from the microdisplay(fig 12), wherein the optical elements directing the reflected light for viewing(abstract, since the system can be used as a display), and further wherein the reflector(fig 12, 58) is positioned in the light path between the microdisplay(fig 12, 15) and the optical elements(fig 2, 5).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Florence (U.S. Patent No. 5,640,214) in view Palmer (U.S. Patent No. 5,847,868) as applied to claim 10 above, and further in view of Karasawa et al.(U.S. Patent No. 5,278,680).

Regarding claim 11, a modified Florence, as detailed in claim rejection 10 above, does not specifically disclose the reflector is planar, although he does disclose a reflector(fig 12, 44a, 44b), he does not specify the shape. However, Karasawa et al. discloses using a planar reflector for redirecting light in a projection system. It would have been obvious to one skilled in the art at the time of the invention to use a a planar reflector, as shown by Karasawa et al., in the projection system of a modified Florence, since as shown by Karasawa et al., planar reflectors are commonly used in projection systems for redirecting the path of light.

Claims 10, 13, 14, 18-20, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. (U.S. Patent No. 6,023,253) in view Palmer (U.S. Patent No. 5,847,868).

Regarding claim 10, Taniguchi et al. discloses; a source of light(fig 2, 1); a microdisplay(fig 2, 5) ; a reflector in position to reflect the light from the source of light to eventually illuminate the microdisplay(fig 2, 4). Taniguchi et al. does not specifically disclose a support surface; the light and the microdisplay are located proximate to the

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support surface and the reflector is located above the support surface. Regarding the support surface, Palmer discloses a support surface(fig 2, 80) used for fixing optical components, which work together, in there necessary positions with the optical components fixed to the top of the support surface(fig 2 and col 8, lines 31-53). It would have been obvious to one skilled in the art at the time of the invention to use a support structure for affixing the optical components to the top of the structure as shown by Palmer, in the optical device of Taniguchi et al., since as shown by Palmer, support structure with optical components attached to the top of the structure are commonly used in optical devices so as to properly align the optical components. Additionally, by attaching the light, microdisplay and reflectors to the top of the support surface, the light and the microdisplay are obviously located proximate to the support surface and the reflector is located above the support surface.

Regarding claim 13, Taniguchi et al. discloses the reflector is a beam splitter(fig 2, 4).

Regarding claim 14, Taniguchi et al. discloses the beam sputter is a polarizing beam sputter(fig 2, 4 and col 4, lines 32-36).

Regarding claim 18, Taniguchi et al. discloses each of the light source and the microdisplay have a primary optical axis, and further wherein these optical axes intersect with one another(fig 12).

Regarding claim 19, Taniguchi et al. discloses the microdisplay is a reflective liquid crystal spatial light modulator(fig 12, 5 and col 9, line 14).

Regarding claim 20, Taniguchi et al. discloses the spatial light modulator is pixellated.(col 4, 13-16).

Regarding claim 22, Taniguchi et al. discloses the beam sputter is optically disposed between both the light source and the spatial light modulator and between the spatial light modulator and a source imaging area, the beam sputter directing light from the light source to the spatial light modulator and from the spatial light modulator to the source imaging area.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al. (U.S. Patent No. 6,023,253) in view Palmer (U.S. Patent No. 5,847,868) as applied to claim 19 above, and further in view of Yamazaki et al.(U.S. Patent No. 5,933,205).

Regarding claim 21, a modified Taniguchi et al., as detailed in claim rejection 19 above, does not specifically disclose the spatial light modulator uses ferroelectric liquid crystal, infact he does not specify the exact type of liquid crystal modulator used(for example a neumatic liquid crystal, ferroelectric liquid crystal, or an anti-ferroelectric liquid crystal). However, Yamazaki et al. discloses using a ferroelectric liquid crystal SLM in a display apparatus. It would have been obvious to one skilled in the art at the time of the invention to use a ferroelectric liquid crystals SLM, as shown by Yamazaki et al., in the projection system of a modified Taniguchi et al., since as shown by Yamazaki

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et al., a ferroelectric liquid crystal SLM is commonly used in projection systems for creating images to be displayed.

Claims 23, 24, 26, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood (U.S. Patent No. 6,348,907) in view Saupe et al. (U.S. Patent No. 5,315,419).

Regarding claim 23, Wood discloses; a source of light located proximate to the support surface, the source being oriented to direct light up and away from the support surface (fig 4, 102); a microdisplay(fig 4, 46) ; an optical element located above the support surface in position to direct the light from the source of light toward the microdisplay(fig 4, 110). Wood does not specifically disclose a support surface; the light and the microdisplay are located proximate to the support surface and the reflector is located above the support surface. Regarding the support surface, Saupe et al. discloses a support surface(fig 6). It would have been obvious to one skilled in the art at the time of the invention to use a support structure as shown by Saupe et al., in the optical device of Wood, since as shown by Saupe et al., a support structure is commonly used in optical devices with spatial light modulators so as to properly support and align the spatial light modulator with the the optical components. Additionally, by a support surface in conjunction with the SLM, the light and the microdisplay are obviously located proximate to the support surface and the optical element is located above the support surface.

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Regarding claim 24, Wood discloses the optical element includes a reflector(fig 4, 110).

Regarding claim 26, Wood discloses the reflector is a beam splitter(fig 4, 110).

Regarding claim 31, Wood discloses wherein each of the light source and the microdisplay have a primary optical axis, and further wherein these optical axes intersect with one another(fig 4).

Allowable Subject Matter

Claims 15, 25, 27-30, 32-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the important features being; the beam splitter is a holographic beam splitter. Where the light is directed away from the support surface the following limitations are important; the reflector is curved, the beam splitter is a polarizing beam splitter; the beam splitter is a holographic beam splitter, the microdisplay is a reflective display, the reflecting device is positioned between optical elements and the SLM.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (703) 305-0881. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (703) 308-4883.

A handwritten signature in black ink that reads "Tim Thompson". The signature is written in a cursive, flowing style.

T.J.T.